Methodology, Business Rules, and Data Components used in the March, 2014 revised Washington State Achievement Index

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Overview of 2013-14 Achievement Index Revision

The Washington Achievement Index has been utilized at the school level for the past four years, with data calculated back to the 2007–08 school year. The revisions described here will be applied to data over three years, starting with 2010-11, 2011-12, and 2012-13 to create the 2013 Washington Achievement Index. The revised *composite Washington Achievement Index* will be based on three consecutive years of data. An annual component of the Index will be calculated, and the composite revised Index will be the mean of the three annual components.

The revised Washington Achievement Index will use three *performance indicators*: Proficiency, Growth (aka "Student Growth"), and Career and College Readiness. The composite Achievement Index will be the 3-year average of the three most recent annual Achievement Index values.

The Proficiency indicator rating will be a combination of proficiency in reading, mathematics, writing and science. Subjects will be weighted equally to calculate the Proficiency Indicator. The Growth indicator rating will be a combination of median student growth percentiles (MSGP) in reading and mathematics, weighted equally. The revised Index for elementary and middle schools will weigh the Growth indicator at 60 percent and the Proficiency indicator at 40 percent. For high schools, the Growth, Proficiency, and Career and College Readiness indicator ratings will be weighted equally. Note. For the calculation of the 2013 Achievement Index, the full 33% weight of the Career and College Readiness Indicator Rating will be derived from graduation rates. Table 1 below summarizes the performance indicators and weighting.

Table 1: Summary of Performance Indicators and Weighting

Performance Indicator	Elementary & Middle Schools	High Schools
Proficiency. Percent of students meeting or exceeding state standards in Reading, Writing, Mathematics, and Science as measured by the Washington Comprehensive Assessment Program (WCAP). The content areas are equally weighted. This indicator will include performance for all students group and targeted subgroups for continuously enrolled students. A school must have at least reading and math to calculate a proficiency score.	40%	33%
Student Growth. Median student growth percentiles (MSGPs) using the methodology employed in the growth model developed by the National Center for the Improvement of Educational Assessment. Growth in Reading and Mathematics will be included for all students group and targeted subgroups for continuously enrolled students. A school must have at least reading and math MSGP values to calculate a growth score.	60%	33%
Career and College Readiness. a. The Adjusted 5-year Cohort Graduation Rates for all students and targeted subgroups. b. The percent of students earning high school credit in a dual credit program* or earning a state or nationally recognized industry certification for all students group and targeted subgroups; to be phased in as data become available. c. The percent of students performing at or above a college- and career-ready cut score on the 11th grade assessment of Common Core State Standards, first administered in 2014-15, for all students group and targeted subgroups.	Not applicable	33%**

Notes:
*Dual credit includes Advanced Placement, International Baccalaureate, Running Start, College in the High School, Tech Prep, and other courses intended to give students advanced credit toward career pathways or degrees.
**Decisions about the weight of graduation rates in relation to indicators (b) and (c) will be decided once those data are available. For the calculation of the 2013 Achievement Index, the full 33% weight of this indicator will be derived from graduation rates.

Each performance indicator (Proficiency, Growth, and Career and College Readiness) will be reported by each subgroup currently used in our state for federal accountability: All Students, American Indian/Alaskan Native, Asian, Black, Hispanic, Pacific Islander, White, Two or More Races, English Language Learner (Current ELL), Special Education, and Low Income. In addition, the subgroup of Former English Language Learner (Former ELL) will also be reported and included in the Index calculation. Performance Indicator Ratings for the All Students group and targeted subgroups are the only ratings used when calculating the annual and composite Achievement Index. Targeted subgroups include all subgroups with the exception of White, Asian, and Two or More Races. The state-wide performance of these subgroups consistently matched or exceeded the All Students group; therefore, they were not included as targeted subgroups. Ratings for the American Indian/Alaskan Native, Black, Hispanic, Pacific Islander, Current ELL, Former ELL, Special Education, and Low Income subgroups will be averaged into a targeted subgroup component rating. The mean of the targeted subgroup component score and the All Students component score will be used to determine the Overall Performance Indicator Rating.

Table 2: Index value assignment for performance indicators

1. **Proficiency Indicator** is based on a rating of the percent of students meeting standard in reading, mathematics, writing, and science (content areas equally weighted) for All Students group and targeted subgroups for continuously enrolled students.

% Met Standard	Rating	% Met Standard	Rating
90 - 100%	10	40 - 49.9%	5
80 - 89.9%	9	30 – 39.9%	4
70 - 79.9%	8	20 – 29.9%	3
60 - 69.9%	7	10 – 19.9%	2
50 - 59.9%	6	0 – 9.9%	1

2. **Growth Indicator** is based on a 10-point rating of the Median Growth Percentile in reading and mathematics for All Students group and targeted subgroups for continuously enrolled students.

Median SGP	Rating	Median SGP	Rating
≥ 70	10	45.0 – 49.99	5
65.0 – 69.99	9	40.0 – 44.99	4
60.0 – 64.99	8	35.0 – 39.99	3
55.0 – 59.99	7	30.0 – 34.99	2
50.0 – 54.99	6	<30	1

3. **Career and College Readiness Indicator** is based on the Adjusted 5-year Cohort Graduation Rate for the All Students group and targeted subgroups. This indicator applies only to schools that graduate students.

Graduation Rate	Rating	Graduation Rate	Rating
≥ 95%	10	70 - 74.9%	5
90 - 94.9%	9	65 - 69.9%	4
85 - 89.9%	8	60 - 64.9%	3
80 - 84.9%	7	55 - 59.9%	2
75 - 79.9%	6	<55%	1

Data Sources for 2013-14 Achievement Index

- **School identification and demographic fields:** this data is a merge of the Priority-Focus analysis created for OSPI in the spring of 2013. School demographics were updated with the 2013 Demographics by School file from the OSPI Report Card, Data Files link. http://reportcard.ospi.k12.wa.us/DataDownload.aspx
  Note: Title-I status and Title-I eligible status are provided from the OSPI office of Special Programs and Federal Accountability.
- **Proficiency**: Data provided by OSPI-Student Information.
- **Median Student Growth Percentiles**: Data provided by OSPI-Student Information.
- **Adjusted 5-Year Cohort Graduation Rate:** Data provided by OSPI-Student Information.

Business Rule Highlights

In the March 2014 Achievement Index master data file, there are a combination of business rules and implementation decisions/formulas. This section presents an overview of the business rules as implemented.

Minimum N rule: A minimum sample size of 20 is applied to all performance indicators. The following rules apply at both the "All-students" group and for any of the targeted subgroups.

- Proficiency: Minimum N is applied per content area per school. Content areas are reading, writing, mathematics, and science.
- Student Growth: Minimum N is applied per content area per school. Student growth is only calculated in reading and math.
- Graduation Rate: Minimum N is applied per graduation cohort (year) per school on the adjusted 5-year graduation rate data using the adjusted cohort numbers as the N.

Suppression of Data

The suppression of data for N < 20 is handled in the pre-processing steps. This way, once the Achievement Index master data file is created, if there is data (a percentage or a percentile) in a cell it is guaranteed to be N>=20.

Performance Indicator Index value assignment: In the Achievement Index methodology, each of the performance indicators are indexed with a 10-point value. The values are assigned as per Table 2 earlier in this document.

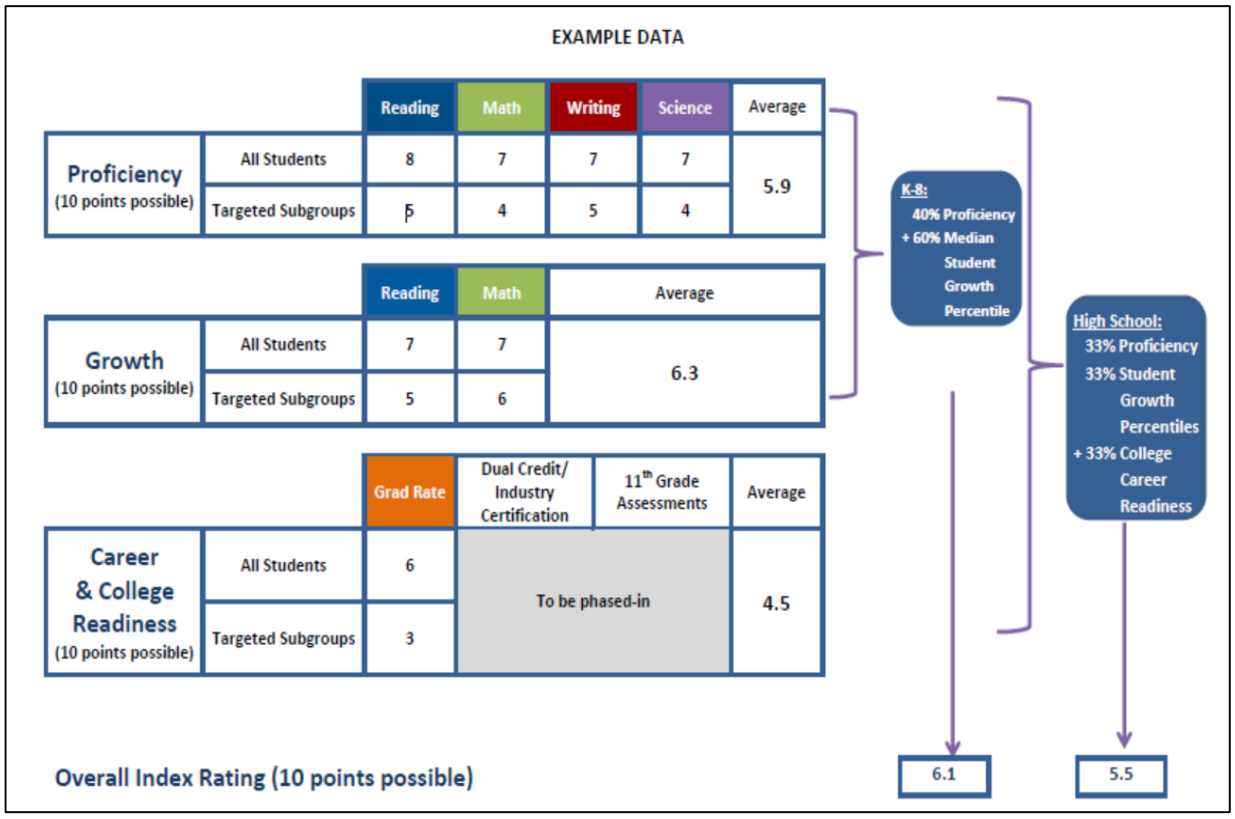
Yearly performance indicators. The following points are implemented in each of the 3 years of data.

- Proficiency: A school must have at least reading and math results to calculate the proficiency performance indicator for either the All- Students group or any targeted subgroup.
- A school is not required to have any targeted-subgroup data to be included in the index calculations as long as they meet the following business rules.
- Student growth: a school must have both reading and math MSGP values in order to calculate the Student Growth performance indicator for either the All- Students group or any targeted subgroup.
- Graduation Rate: a school must have at least the All-students value for this performance indicator to be used for either the All- Students group or any targeted subgroup.
- A High School must have 2 of 3 performance indicators to calculate an Annual Achievement Index. An elementary or middle school must have 1 of 2 performance indicators to calculate an annual Achievement Index.
- Composite Achievement Index. This is the 3-year average of the annual Achievement Index values. A school must have annual Achievement Index values in all 3 years in order to calculate a Composite Achievement Index.

Application of Methodology for yearly Achievement Index calculations

The business rules applied follow the representation in Figure 1 but are applied in a horizontal fashion (due to the spreadsheet implementation).

Figure 1: Yearly Achievement Index example



Weighting: As shown above, the weighting is 60:40 ratio for Student Growth vs. Proficiency for any school which does not graduate students and an equal weighting of the performance indicators in high schools.

"High School" defined. Given the variety of school configurations in this state (e.g. 9-12 traditional high schools, as well as K-12, 7-12, 6-12, etc), in these business rules a school is defined as a high school if, in any of the three years in the index, the school had 1 or more students in their graduation cohort data.

Composite Achievement Index

In order to calculate a Composite Achievement Index, the school must have Annual Achievement Index values for all three years. If that is true, then:

Composite AI_N= Composite Achievement Index for year N

Composite AI := $(AI_{year\ N-2} + AI_{year\ N-1} + AI_{year\ N}) / 3$

Stack ranking based on Composite Achievement Index

When the business rules are applied, schools will either have, or not have a resulting Composite Achievement Index. For the 2010-11, 2011-12, and 2012-13 three-year Composite Index, 1,801 schools in the state of Washington received a Composite Achievement Index.

Implementation Details- Application of Business Rules

Variable Naming: The columns contained in the Achievement Index file use the following naming

- First 2 characters: Content area for proficiency. Abbreviated as "R-" for reading, "M-" for math, "W-" for writing, and "S-" for science.
- The second component represents the performance indicator. "MetPcnt-" for proficiency percentage meeting or exceeding standard, "MGP-" for Median Growth Percentile, and "Grad-" for graduation rate.
- The third component represents the year. These are "2011-", "2012-", and "2013-". E.g. the 2010-11 academic year is commonly referred to as "2011 MSP data" so this component would be "-2011".
- The fourth component, if present, represents the subgroup abbreviation. For example "-LowIncome" for the low income subgroup and "-PacIsl" for Pacific Islander.

  For Example

  "M-MetPCNT-2011-ALL": the variable name for Math proficiency for the 2011 MSP/EOC data for the "All-students" subgroup".

  "MGP-Math-2011-FormerELL": the variable name for Median Student Growth Percentile for 2011 for the Former-ELL subgroup.

Yearly Calculations

- 2011 data/calculations: Columns Q – DW
- 2012 data data/calculations: Columns DY – IE
- 2013 data/calculations: Columns IG – ML

In the yearly calculations (e.g. columns Q – DW for 2011), the structure of the columns:

- Proficiency: 56 Columns
  - 6 columns for All-Student proficiency, ordered as Reading, Math, Writing, and Science.
  - 44 columns for targeted subgroup proficiency
  - Overall Proficiency Index combining All-Students and Targeted subgroups. This is column BT for 2011 is highlighted bright yellow.
- Student Growth: 32 columns
  - 4 columns for Student Growth for the All-students subgroup.
  - 24 columns for the student growth for targeted subgroups.
  - 2 columns for the overall student growth component average This is column DA for 2011 (column highlighted yellow).
- Graduation Rate: 15 columns
  - 10 columns for graduation rate for All-Students and targeted subgroups.
  - 2 columns for the overall graduation rate component average. This is column DQ for 2011 (column highlighted yellow).
- Annual Achievement Index: 4 columns
  - 4 columns (DS to DV for 2011) to combine the three performance indicators into the Annual Achievement Index. Note that due to the weighting differences with High Schools noted above, there are two formulas applied depending on whether the school is a High School or not.

    Column DV is the final Annual Achievement Index for 2011 (column highlighted yellow).

Composite Achievement Index Calculation

- Column MN to MT

The complexity in the Achievement Index is largely contained within the yearly calculations. Calculation of the Composite Achievement Index is straightforward.

- IF the school has Annual Achievement Index values for 2011, 2012, and 2013, THEN we calculate the average for these 3 values.

  This is Column MO which is highlighted yellow.

Note. For the rankings to determine tiers and designation for Federal accountability, the 3-year graduation rate is also provided and used in the stack ranking. This is in column MQ in the spreadsheet.

Final Stack Ranking of the Composite Achievement Index

1. Rank based on Composite AI. Assign the highest Composite AI as #1 and number to the lowest (1801 for this data set).
2. Mark those without a Composite AI as "No-AI".
3. For those "No-AI", sort schools based on Grad Rate and mark those with Grade Rate < 60% as "GR60-No-AI"